U.S. Department
of Transportation

**Research and
Special Programs
Administration**

AUG 3 1 2000

400 Seventh Street, S.W.
Washington, D.C. 20590

DOT-E 10785
(SIXTH REVISION)

EXPIRATION DATE: July 31, 2002

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Kay-Ray/Sensall, Inc.
Mount Prospect, Illinois

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the manufacture, mark, sale and use of non-DOT specification cylinders containing certain Divisions 2.2 and 2.3 gases as described in paragraph 6 below to be transported in radiation detectors rather than in DOT Specification cylinders. This exemption provides no relief from any Hazardous Materials Regulation other than as specifically stated herein.

b. The safety analyses performed in development of this exemption only considered the hazards and risks associated with transportation in commerce.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.302(a), 175.3 and 172.101, Column 9 in that the boron trifuloride is forbidden by aircraft except as prescribed herein.

5. BASIS: This exemption is based on the application of Kay-Ray/Sensall, Inc. dated July 26, 2000, submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Proper Shipping Name/ Hazardous Material Description	Hazard Class/ Division	Identification Number	Packing Group
Argon, compressed	2.2	UN1006	N/A
Boron trifluoride	2.3	UN1008	N/A
Helium, compressed	2.2	UN1046	N/A
Hexafluoroethane, R116	2.2	UN2193	N/A
Xenon, compressed	2.2	UN2036	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Prescribed packagings are radiation detection chambers which are a component of a non-contacting measurement system, commonly described as nuclear gauging devices. These gas filled cylindrical shaped radiation detectors consist of metal cylinders with welded, brazed, or soldered joints; brazed ceramic to metal insulator feed-through assemblies for electrical connectors; and a metal fill tube, manufactured in accordance with applicable drawings on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA) and conforming to the following:

a. Type, Inner Gas Containment Dimensions and Material.

(1) Type I Cylinder:

INNER GAS CONTAINMENT DIMENSIONS: 6.0" (15.2 cm) - 6.5" (16.5 cm) in diameter x 13.5" (34.2 cm) - 125" (317.5 cm) in length
MAX. ENCLOSED VOLUME: 4148 cubic inches (68 liters)
MATERIAL: ASTM A-513 or 300 series stainless steel
MIN. WALL THICKNESS: 0.105" (0.267 cm)
MAX. FILL PRESSURE: 160 psig (1200 kPa)
GAS CONTAINED: Argon or Freon-116

(2) Type II Cylinder:

INNER GAS CONTAINMENT DIMENSIONS:5.0" (12.7 cm) - 8.5" (21.6 cm) in diameter x 8.5" (21.6 cm) - 11.25" (28.6 cm) in length
MAX. ENCLOSED VOLUME: 639 cubic inches (10.5 liters)
MATERIAL: HRS C-1015, CRS 1018, or 300 series stainless steel
MIN. WALL THICKNESS: 0.0598" (0.152 cm)
MAX. FILL PRESSURE: 160 psig (1200 kPa)
GAS CONTAINED: Argon or Freon-116

(3) Type III Cylinder:

INNER GAS CONTAINMENT DIMENSIONS: 3.5" (8.89 cm) - 4.0" (10.2 cm) in diameter x 7.5" (19.1 cm) - 16.0" (40.6 cm) in length
MAX. ENCLOSED VOLUME: 201 cubic inches (3.27 liters)
MATERIAL: 300 series stainless steel
MIN. WALL THICKNESS: 0.065" (0.165 cm)
MAX. FILL PRESSURE: 360 psig (2,580 kPa)
GAS CONTAINED: Argon or Freon-116

(4) Type III-N Cylinder:

INNER GAS CONTAINMENT DIMENSIONS: 3.87" (9.83 cm) in diameter x 7.62" (19.4 cm) or 15.62" (39.7 cm) in length
MAX. ENCLOSED VOLUME: 90 cubic inches (1.48 liters) or 184 cubic inches (3.02 liters)
MATERIAL: 300 series stainless steel
MIN. WALL THICKNESS: 0.065" (0.165 cm)
MAX. FILL PRESSURE: 2 psig (115 kPa) or 45 psig (412 kPa)
GAS CONTAINED: Boron trifluoride or Helium-3

(5) Type IV Cylinder:

INNER GAS CONTAINMENT DIMENSIONS: 2.0" (5.10 cm) - 2.5" (6.35 cm) in diameter x 8.0" (20.3 cm) - 13.0"(33.0 cm) in length
MAX. ENCLOSED VOLUME: 64 cubic inches (1.05 liters)
MATERIAL: ASTM A-513

MIN. WALL THICKNESS: 0.049" (0.124 cm)
MAX. FILL PRESSURE: 360 psig (2580 kPa)
GAS CONTAINED: Argon, Freon-116, or Xenon

b. The design burst pressure of the cylinder must be at least 4 times the maximum filling pressure.

c. When offered for transportation, the nuclear gauging device may be comprised of one package containing both the radioactive material source component and the radiation detection component which includes the elements described in paragraph 7(a); or the radioactive material may be in one package and the radiation detection component in a second package. Under either conditions, the package containing radioactive material must be in full compliance with the radioactive material provisions of 49 CFR Parts 100 - 177. The gas filled radiation detectors, or the component containing the detectors, must be in strong outside packagings as described in the May 22, 1992 application for the exemption, and must protect the gas filled detector from damage during transport.

d. Notwithstanding § 175.3, packages containing no more than 11.6 grams of boron trifluoride at pressures less than 2 psig (115 kPa) may be transported by passenger or cargo aircraft.

8. SPECIAL PROVISIONS:

a. In accordance with the provisions of Paragraph (b) of § 173.22a, persons may use the packaging authorized by this exemption for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this exemption.

b. A person who is not a holder of this exemption, but receives a package covered by this exemption, may reoffer it for transportation provided no modifications or changes are made to the package and it is offered for transportation

c. Each person offering for transportation a package containing a system component that includes radioactive material must satisfy all requirements for packaging, marking, labeling, transport documentation, modal restrictions (including

§ 173.448(e) and (f)), and all other Class 7 (radioactive material) provisions of 49 CFR Parts 171 - 177.

d. Except when transported by air, packages containing only the gas filled radiation detector components of the gauging systems are excepted from 49 CFR Part 172, Subparts E (labeling) and F (placarding).

e. Each gas filled radiation detector authorized for transport under this exemption must bear the name of the manufacturer. The outer packagings used for the transport of the gas filled detectors must bear the name of the person offering the shipment. Radioactive material packages must be marked with the name of the person certifying that the package meets the requirements of paragraph 8(a).

f. A current copy of this exemption must be maintained at each facility where the package is manufactured under this exemption. It must be made available to a DOT representative upon request.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, cargo aircraft only, and passenger-carrying aircraft.

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel, aircraft or motor vehicle used to transport packages covered by this exemption. The shipper must furnish a copy of this exemption to the air carrier before or at the time the shipment is tendered.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this exemption and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

- All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, Parts 171-180.
- Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this exemption must receive training on the requirements and conditions of this exemption in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this exemption, including display of its number, when the exemption has expired or is otherwise no longer in effect.

12. REPORTING REQUIREMENTS: The carrier is required to report any incident involving loss of packaging contents or packaging failure to the Associate Administrator for Hazardous Materials Safety (AAHMS) as soon as practicable. (Sections 171.15 and 171.16 apply to any activity undertaken under the authority of this exemption.) In addition, the holder(s) of this exemption must also inform the AAHMS, in writing, as soon as practicable of any incidents involving the package and shipments made under this exemption.

Issued at Washington, D.C.

FOR Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

AUG 3 1 2000
(DATE)

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590. Attention: DHM-31.

The original of this exemption is on file at the above office. Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

PO: sdc